

## ABSTRACT

Mesoporous aluminum oxides with high surface areas have been synthesized using inexpensive, small organic templating agents instead of surfactants. Optionally, some of the aluminum can be framework-substituted by one or more other elements. The material has high thermal stability and possesses a three-dimensionally randomly connected mesopore network with continuously tunable pore sizes. This material can be used as catalysts for dehydration, hydrotreating, hydrogenation, catalytic reforming, steam reforming, amination, Fischer-Tropsch synthesis and Diels-Alder synthesis, etc.